

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Canceled).
2. (Canceled).
3. (Currently Amended) ~~The organic electrolytic solution of claim 1,~~
lithium sulfur battery according to claim 16, wherein the oxalate compound of said formula (1) of said organic electrolytic solution is selected from the group consisting of diethyl oxalate, dimethyl oxalate, dipropyl oxalate, dibutyl oxalate, and bis-(4-methylbenzyl) oxalate.
4. (Currently Amended) ~~The organic electrolytic solution of claim 1,~~
lithium sulfur battery according to claim 16, wherein the organic solvent of said organic electrolytic solution is at least one selected from the group consisting of a polyglyme, a dioxolane, a carbonate, 2-fluorobenzene, 3-fluorobenzene, 4-fluorobenzene, dimethoxyethane, diethoxyethane, and sulfolane.
5. (Currently Amended) ~~The organic electrolytic solution of~~ lithium sulfur battery according to claim 4, wherein the organic solvent of said organic electrolytic solution comprises a polyglyme selected from the group consisting of diethyleneglycol dimethylether ($\text{CH}_3(\text{OCH}_2\text{CH}_2)_2\text{OCH}_3$), diethyleneglycol diethylether

($\text{C}_2\text{H}_5(\text{OCH}_2\text{CH}_2)_2\text{OC}_2\text{H}_5$), triethyleneglycol dimethylether ($\text{CH}_3(\text{OCH}_2\text{CH}_2)_3\text{OCH}_3$), and triethyleneglycol diethylether ($\text{C}_2\text{H}_5(\text{OCH}_2\text{CH}_2)_3\text{OC}_2\text{H}_5$).

6. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 4, wherein the organic solvent of said organic electrolytic solution comprises a dioxolane, which is at least one selected from the group consisting of include 1,3-dioxolane, 4,5-diethyl-dioxolane, 4,5-dimethyl-dioxolane, 4-methyl-1,3-dioxolane, and 4-ethyl-1,3-dioxolane.

7. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 4, wherein the organic solvent of said organic electrolytic solution is a mixture of the polyglyme and the dioxolane in a ratio of 1:9-9:1 by volume.

8. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 4, wherein the organic solvent of said organic electrolytic solution comprises a carbonate, which is at least two selected from the group consisting of ethylene carbonate, methylene carbonate, diethyl carbonate, dimethyl carbonate, γ -butyrolactone, propylene carbonate, methyl ethyl carbonate, and vinylene carbonate.

9. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim [1] 16, wherein the organic solvent of said organic electrolytic solution is at least one of a polyglyme and a dioxolane.

10. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 9, wherein [the] said polyglyme [for] of the organic solvent of said organic electrolytic solution is selected from the group consisting of diethyleneglycol dimethylether ($\text{CH}_3(\text{OCH}_2\text{CH}_2)_2\text{OCH}_3$), diethyleneglycol diethylether ($\text{C}_2\text{H}_5(\text{OCH}_2\text{CH}_2)_2\text{OC}_2\text{H}_5$), triethyleneglycol dimethylether ($\text{CH}_3(\text{OCH}_2\text{CH}_2)_3\text{OCH}_3$), and triethyleneglycol diethylether ($\text{C}_2\text{H}_5(\text{OCH}_2\text{CH}_2)_3\text{OC}_2\text{H}_5$).

11. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 9, wherein the dioxolane ~~for the~~ of said organic solvent of said organic electrolytic solution is at least two selected from the group consisting of include 1,3-dioxolane, 4,5-diethyl-dioxolane, 4,5-dimethyl-dioxolane, 4-methyl-1,3-dioxolane, and 4-ethyl-1,3-dioxolane.

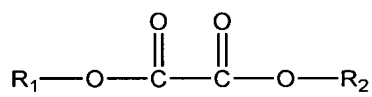
12. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 9, wherein [the] said organic solvent of said organic electrolytic solution further comprises at least one selected from the group consisting of sulfolane, dimethoxyethane, and diethoxyethane.

13. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim [1] 16, wherein [the] said organic solvent of said organic electrolytic solution is at least one selected from the group consisting of a carbonate, 2-fluorobenzene, 3-fluorobenzene, 4-fluorobenzene, dimethoxyethane, diethoxyethane, and sulfolane.

14. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 13, wherein [the] said organic solvent of said organic elctrolytic solution comprises a carbonate, which is at least one selected from the group consisting of ethylene carbonate, methylene carbonate, diethyl carbonate, dimethyl carbonate, γ -butyrolactone, propylene carbonate, methyl ethyl carbonate, and vinylene carbonate.

15. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim [1] 16, wherein [the] said lithium salt has a concentration of 0.5-2.0M.

16. (Currently Amended) A lithium sulfur battery comprising:
a cathode;
an anode;
a separator interposed between the cathode and the anode; and
[the] an organic electrolytic solution ~~of claim 1~~ comprising:
a lithium salt;
an organic solvent; and
an oxalate compound of formula (1) below:



...(1)

where R_1 and R_2 are independently selected from hydrogen atom, halogen atom, a hydroxy group, a substituted or unsubstituted C_1 - C_{20} alkyl group, a substituted or unsubstituted C_1 - C_{20} alkoxy group, a substituted or unsubstituted C_1 - C_{20} alkenyl group, a substituted or unsubstituted C_6 - C_{30} aryl group, a substituted or unsubstituted C_6 - C_{30} arylalkyl group, a substituted or unsubstituted C_6 - C_{30} aryloxy group, a substituted or unsubstituted C_2 - C_{30} heteroaryl group, a substituted or unsubstituted C_2 - C_{30} heteroarylalkyl group, a substituted or unsubstituted C_2 - C_{30} heteroaryloxy group, a substituted or unsubstituted C_5 - C_{20} cycloalkyl group, and a substituted or unsubstituted C_2 - C_{20} heterocycloalkyl group.

wherein the amount of the oxalate compound of said formula (1) is in a range of 0.001-10 parts by weight with respect to 100 parts by weight of the organic solvent, and

wherein during use in said lithium sulfur battery said oxalate compound of formula (1) chelates with lithium ions and bonding between lithium ions and sulfide anions is blocked so that the solubility of sulfide ions is improved.

17. (Previously Presented) The lithium sulfur battery of claim 16, wherein the cathode is formed of at least one selected from the group consisting of a lithium composite oxide, simple substance sulfur, kasolite containing Li_2S_n where $n \geq 1$, organo-sulfur, and $(C_2S_x)_y$ where x ranges from 2.5 to 20 and $y \geq 2$.

18. (Previously Presented) The lithium sulfur battery of claim 16, wherein the anode is formed as a lithium metal electrode, a lithium-metal alloy electrode, a

lithium-inert sulfur composite electrode, a carbonaceous electrode, or a graphite electrode.

19. (Currently Amended) ~~An organic electrolytic solution for use in a~~ A lithium sulfur battery comprising:

a cathode;

an anode;

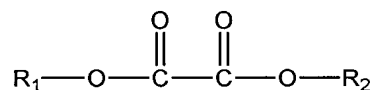
a separator interposed between the cathode and the anode; and

an organic electrolytic solution comprising:

a lithium salt;

an organic solvent; and

an oxalate compound of formula (1) below:



...(1)

where R₁ and R₂ are independently selected from hydrogen atom, halogen atom, a hydroxy group, a substituted or unsubstituted C₁-C₂₀ alkyl group, a substituted or unsubstituted C₁-C₂₀ alkoxy group, a substituted or unsubstituted C₁-C₂₀ alkenyl group, a substituted or unsubstituted C₆-C₃₀ aryl group, a substituted or unsubstituted C₆-C₃₀ arylalkyl group, a substituted or unsubstituted C₆-C₃₀ aryloxy group, a substituted or unsubstituted C₂-C₃₀ heteroaryl group, a substituted or unsubstituted C₂-C₃₀ heteroarylalkyl group, a substituted or unsubstituted C₂-C₃₀

heteroaryloxy group, a substituted or unsubstituted C₅-C₂₀ cycloalkyl group, and a substituted or unsubstituted C₂-C₂₀ heterocycloalkyl group,

wherein the amount of the oxalate compound of said formula (1) is in a range of 0.001-10 parts by weight with respect to 100 parts by weight of the organic solvent,

wherein during use in said lithium sulfide sulfur battery said oxalate compound of formula (1) chelates with lithium ions and bonding between lithium ions and sulfide anions is blocked so that the solubility of sulfides anions is improved, and

wherein the oxalate compound of said formula (1) is selected from the group consisting of diethyl oxalate, dimethyl oxalate, dipropyl oxalate, dibutyl oxalate, and bis-(4-methylbenzyl) oxalate, and

wherein the organic solvent is at least one selected from the group consisting of a polyglyme, a dioxolane, a carbonate, 2-fluorobenzene, 3-fluorobenzene, 4-fluorobenzene, dimethoxyethane, diethoxyethane, and sulfolane.

20. (Currently Amended) The ~~organic electrolytic solution of~~ lithium sulfur battery according to claim 19, wherein the organic solvent of the organic electrolytic solution comprises a polyglyme selected from the group consisting of diethyleneglycol dimethylether (CH₃(OCH₂CH₂)₂OCH₃), diethyleneglycol diethylether (C₂H₅(OCH₂CH₂)₂OC₂H₅), triethyleneglycol dimethylether (CH₃(OCH₂CH₂)₃OCH₃), and triethyleneglycol diethylether (C₂H₅(OCH₂CH₂)₃OC₂H₅), or

wherein the organic solvent comprises a dioxolane, which is at least one selected from the group consisting of include 1,3-dioxolane, 4,5-diethyl-dioxolane, 4,5-dimethyl-dioxolane, 4-methyl-1,3-dioxolane, and 4-ethyl-1,3-dioxolane.

21. (Canceled).

22. (Currently Amended) ~~The organic electrolyte solution of claim 1~~ lithium sulfur battery according to claim 16, wherein the oxalate compound of formula (1) is in the range of 0.05 - 1 part by weight with respect to 100 parts by weight of the organic solvent.